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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/665,392	09/22/2003	Tomoaki Takahashi	Q77602	4204
23373	7590	02/27/2006	EXAMINER	
SUGHRUE MION, PLLC 2100 PENNSYLVANIA AVENUE, N.W. SUITE 800 WASHINGTON, DC 20037			GARCIA JR, RENE	
			ART UNIT	PAPER NUMBER
			2853	

DATE MAILED: 02/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/665,392

Applicant(s)

TAKAHASHI, TOMOAKI

Examiner

Rene Garcia, Jr.

Art Unit

2853

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 November 2005.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-49 is/are pending in the application.
4a) Of the above claim(s) 28-46 is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-7,9-19,21-26 and 49 is/are rejected.
7) ☒ Claim(s) 8,20,27,47 and 48 is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 25 November 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 18 January 2006.

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 4-7, 9, 10, 13, 16-19 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Otsuka et al. (US 6,899,413) in view of Yanagawa (US 5,984,448).

Otsuka et al. disclose the following claimed limitations:

*regarding claims 1 and 13, liquid ejection apparatus (fig. 1; col. 5, lines 28-29) and an apparatus for controlling/**controller, 200/** (fig. 2; col. 6, line 17);

*head member/**cartridge, 2/** (fig. 1), provided with nozzles including a plurality of nozzle groups each associated with one of a plurality of colors of liquid (col. 6, line 62- col. 7, line 17)

*carriage/**2/**, operable to carry the head member/cartridge, 1/ so as to reciprocally transverse a first region in which a medium, on which the liquid droplet is landed, is placed (col. 5, line 41)

*head member transverse the first region in a first direction, and the head member transverse the first region in a second direction opposite to the first direction (col. 5 lines 6-7)

*regarding claims 4 and 16, tone confirmation controller/host apparatus, 210/ (col. 6, lines 21-25; computer, operable to control the pattern data adjuster, the controller and the

Art Unit: 2853

carriage such that: (it is an inherent feature in the art that when half-toning is used in image formation it is being controlled by a controller which is used by the other functions [pattern data adjuster, controller and carriage]to create the final print data)

*at least one first liquid mixing portion, at which liquid droplets of the plural colors are superposed (col. 8 line 1; dot-on-dot/superposed/), is formed on the medium when the head member transverses the first region in the first direction

*plurality of second liquid mixing portions, at which liquid droplets of the plural colors are superposed while varying the ejected number of the liquid droplet per the unit area, are formed on the medium when the head member transverse the first region in the second direction (col. 7 line 67-col. 8 lines 25 – forward path/first direction/, backward path/second direction/; col. 3 line 30-49 – applying the color inks at different amounts/varying the ejected number of the liquid droplet per the unit area/)

*wherein the at least one first liquid mixing portion and the second liquid mixing portions are arranged on the medium in a comparative manner/arranged symmetrically/ (col. 4 line 67-col. 5 line 6)

*regarding claims 5 and 17, a plurality of first liquid mixing portions are formed (col. 4 lines 14-20)

*regarding claims 6, 7, 18 and 19, the medium/8/ is placed in the first region/automatic sheet feeder [ASF]/ movably in a third direction perpendicular to the first direction and the second direction (fig. 1; col. 5 lines 51-col. 6 line 4; from the bottom edge of the ASF towards

Art Unit: 2853

the head cartridge is third direction, first and second direction is the forward and backward path of the carriage)

*the second liquid mixing portions are arranged in the second direction (col. 8, lines 12-25; forward path is first direction and backward path is second direction)

*the first liquid mixing portion and the second liquid mixing portions are adjacent in the third direction (fig. 3; col. 5, lines 55-57 & col. 7, lines 63-65 & col. 3, lines 60-62; raster lines make up the scan direction which represent different positions on the print medium [medium is shifted/adjacent in the third direction/])

*regarding claims 9 and 21, the first liquid mixing portions are formed by superposing liquid droplets of the plural colors while varying the ejected number of the liquid droplet per the unit area, when the head member transverses the first region in the first direction (col. 3, lines 51-59 & col. 4, lines 21-23; secondary colors are formed by mixing/superposing/ colors on printing material & secondary color pixel area arranged in a predetermined direction/first direction/)

*regarding claim 10, the nozzle groups are at least three groups respectively associated with cyan liquid, magenta liquid and yellow liquid (fig. 3; 100 cyan ink; 101 magenta ink; 102 yellow ink; all are heads containing nozzles [col. 7 lines 8-16])

Otsuka et al. does not disclose the following claimed limitations:

*regarding claims 1 and 13, plurality of pressure fluctuation generator each of which is operable to generate pressure fluctuation in liquid in each of the nozzles to eject a liquid droplet therefrom

*signal generator, operable to generate a first signal and a second signal

*controller, operable to drive the pressure fluctuation generator according to the first signal and ejection pattern data, and to drive the pressure fluctuation generator according to the second signal and the ejection pattern data

*pattern data adjuster, operable to adjust the ejection pattern data so as to vary an ejected number of the liquid droplet per a unit area, for each of the nozzle groups

Yanagawa disclose the following:

*regarding claims 1 and 13, plurality of pressure fluctuation generator/piezoelectric actuators, 31/(fig. 3), each of which is operable to generate pressure fluctuation in liquid in each of the nozzles to eject a liquid droplet therefrom (col. 9, lines 46-47)

*signal generator/waveform generator, 11/(fig. 1), operable to generate a first signal and a second signal (col. 14, lines 1-11; printing cycle is made up of periods T0 to T4 which would constitute one signal and multiple cycles are generated during a printing operation))

*controller/circuit, 10/ (fig. 1), operable to drive the pressure fluctuation generator according to the first signal and ejection pattern data, and to drive the pressure fluctuation generator according to the second signal and the ejection pattern data (fig. 1; col. 12, lines 38-51)

*pattern data adjuster, operable to adjust the ejection pattern data so as to vary an ejected number of the liquid droplet per a unit area, for each of the nozzle groups (col. 3, lines 25-42;

Art Unit: 2853

col. 4, lines 6-11 & 53-55; driving voltage controls piezoelectric actuators which make up the nozzle groups)

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to utilize a plurality of pressure fluctuation generator each of which is operable to generate pressure fluctuation in liquid in each of the nozzles to eject a liquid droplet therefrom; a signal generator, operable to generate a first signal and a second signal; a controller, operable to drive the pressure fluctuation generator according to the first signal and ejection pattern data, and to drive the pressure fluctuation generator according to the second signal and the ejection pattern data; and a pattern data adjuster, operable to adjust the ejection pattern data so as to vary an ejected number of the liquid droplet per a unit area, for each of the nozzle groups as taught by Yanagawa into Otsuka et al. for the purposes of: to achieve high resolution printing; discharging a minimal ink droplet; for driving the piezoelectric actuators; to control area of individual dots on recording media to vary the density; printing characters and graphics and the like in which the density of dots on the recording media is maximum and constant to print in a high quality.

3. Claims 2, 3, 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Otsuka et al. (US 6,899,413) as modified by Yanagawa (US 5,984,448) as applied to claim 1 above, and further in view of Corrigan, III et al. (US 6,386,674).

Otsuka et al. as modified by Yanagawa disclose all of the claimed limitations except for the following:

*regarding claims 2 and 14, first signal and the second signal are different from each other

*regarding claims 3 and 15, first signal and the second signal are identical with each other

Corrigan, III et al. disclose the following:

*regarding claims 2 and 14, first signal and the second signal are different from each other (col. 9, lines 24-50; col. 5, lines 32-44; signal/fire pulse/, voltage levels are set to generate specific ink drop volumes, each specific ink drop volume is a different fire pulse; to create different ink drop volumes different signals/fire pulses/ are needed)

*regarding claims 3 and 15, first signal and the second signal are identical with each other (col. 9, lines 24-50; col. 5, lines 32-44; signal/fire pulse/, voltage levels are set to generate specific ink drop volumes, each specific ink drop volume is a different fire pulse; to create identical ink drop volumes identical signals/fire pulses/ are needed)

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to utilize a drive signal generator capable of generating a first and second which are different from each and a drive signal generator capable of generating a first and second which are identical with each other as taught by Corrigan, III et al. into Otsuka et al. as modified by Yanagawa for the purpose of emitting a desired ink drop volume from the ink ejection elements/nozzles/ (col. 5, lines 43-44).

4. Claims 7 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Otsuka et al. (US 6,899,413) as modified by Yanagawa (US 5,984,448) as applied to claims 1 and 13 respectively above, and further in view of Otsuki et al. (US 6,692,096).

The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention “by another”; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). This rejection might also be overcome by showing that the reference is disqualified under 35 U.S.C. 103(c) as prior art in a rejection under 35 U.S.C. 103(a). See MPEP § 706.02(I)(1) and § 706.02(I)(2).

Otsuka et al. as modified by Yanagawa disclose all of the claimed limitations except for the following:

- *further regarding claims 7 and 19, the second liquid mixing portions are arranged in the third direction

- *the first liquid mixing portion and the second liquid mixing portions are adjacent in the second direction

Otsuki et al. disclose the following:

*further regarding claims 7 and 19, the second liquid mixing portions are arranged in the third direction (fig. 10; forward(x)/first direction/, y/third direction/, reverse/second direction/; C/second liquid mixing portions/)

*the first liquid mixing portion/K/ and the second liquid mixing portions/C/ are adjacent in the second direction (fig. 10)

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to utilize the second liquid mixing portions arranged in the third direction and the first liquid mixing portion and the second liquid mixing portions are adjacent in the second direction as taught by Otsuki et al. into Otsuka et al. as modified by Yanagawa for the purpose creating a reference value for determining a reference correction value for adjustment between the forward and reverse main scanning passes.

5. Claims 11 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Otsuka et al. (US 6,899,413) as modified by Yanagawa (US 5,984,448) as applied to claims 1 and 13 respectively above, and further in view of Usui et al. (USPGPUB 2002/0196471).

Otsuka et al. as modified by Yanagawa disclose all of the claimed limitations except for the following:

*regarding claims 11 and 22, the unit area includes a matrix pattern constituted by a plurality of pixels each of which is associated with one liquid droplet

Usui et al. disclose the following:

*regarding claims 11 and 22, the unit area includes a matrix pattern constituted by a plurality of pixels each of which is associated with one liquid droplet (paragraphs 0160 and

Art Unit: 2853

0002; unit area defined by matrix of 12 rows x 8 columns; matrix pattern/dither pattern table/ makes up pixels associated with dots; fig. 6 ref 12d)

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to utilize the unit area including a matrix pattern constituted by a plurality of pixels each of which is associated with one liquid droplet as taught by Usui et al. into Otsuka et al. as modified by Yanagawa for the purpose of minimizing moiré patterns and other artifacts in printouts.

6. Claims 12 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Otsuka et al. (US 6,899,413) as modified by Yanagawa (US 5,984,448) as applied to claims 1 and 13 respectively above, and further in view of Suzuki et al. (US 4,342,051).

Otsuka et al. as modified by Yanagawa disclose all of the claimed limitations except for the following:

* regarding claims 12 and 23, size of the unit area is variable according to the ejection pattern data

Suzuki et al. disclose the following:

* regarding claims 12 and 23, size of the unit area is variable according to the ejection pattern data (col. 1, lines 35-41 & lines 55-60; reproduction/recording/ of half-tone images, differing sizes of matrices corresponding to image densities/size of the unit area/)

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to vary the size of the unit area according to the ejection pattern data as taught by Suzuki et al. into Otsuka et al. as modified by Yanagawa for the purpose of maintaining the sharpness of the original image.

Art Unit: 2853

7. Claims 24-26 and 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Otsuka et al. (US 6,899,413) as modified by Yanagawa (US 5,984,448) as applied to claims 1 and 4 above, and further in view of Nakano (US 5,506,696).

Otsuka et al. as modified by Yanagawa disclose all of the claimed limitations except for the following:

- *regarding claims 24 and 49, comparing the second liquid mixing portions with the first liquid mixing portion to select one of the second liquid mixing portions having a tone closest to a tone of the first liquid mixing portion

- *adjusting the ejection pattern data so as to correspond to an ejected number of the liquid droplet per the unit area which is associated with the selected one of the second liquid mixing portions

- *regarding claim 25, comparing step is performed with operator's eyes

- *regarding claim 26, comparing step is performed with a colorimetry device

Nakano disclose the following:

- *regarding claims 24 and 49, comparing the second liquid mixing portions with the first liquid mixing portion to select one of the second liquid mixing portions having a tone closest to a tone of the first liquid mixing portion

- *adjusting the ejection pattern data so as to correspond to an ejected number of the liquid droplet per the unit area which is associated with the selected one of the second liquid mixing portions (col. 3, line 21-col. 4 line 12; colorimetry means generates colorimetric value signal to

Art Unit: 2853

measure a color sample/compare second and first liquid mixing portion/; conversion means for generating color separation value signal/selected portion/; processor uses color separation value signal to generate final printed image).

*regarding claim 25, comparing step is performed with operator's eyes (col. 8, lines 29-31 and 45-48 & col. 13, lines 42-45; operator observes [observation in the instance is done with eyes] to confirm output and has the ability edit colorimetry result via interactive input section 11)

*regarding claim 26, comparing step is performed with a colorimetry device/2/ (fig. 1; col. 7, lines 64-65)

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to utilize comparing the second liquid mixing portions with the first liquid mixing portion to select one of the second liquid mixing portions having a tone closest to a tone of the first liquid mixing portion; adjusting the ejection pattern data so as to correspond to an ejected number of the liquid droplet per the unit area which is associated with the selected one of the second liquid mixing portions; a comparative step using a colorimetry device or operator's eyes as taught by Nakano into Otsuka et al. as modified by Yanagawa for the purpose of accurately reproducing the color to be reproduced using the image output device.

Response to Arguments

8. Applicant's arguments filed 25 November 2005 have been fully considered but they are not persuasive.

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the

Art Unit: 2853

teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Yanagawa discloses area gradation method for the purpose of maintaining print quality (column 4 lines 40-49 of Yanagawa (US 5,984,448)).

In response to arguments with respect to independent claims 1 and 13, applicant states that Yangawa does not suggest a pattern data adjuster to vary the number of droplets in a certain area, however with regards to column 3 lines 25-42, Yangawa discloses adjusting number of drops per liquid area [one dot with a set of plural fine droplets]. Controlling the number of droplets in a certain area is to either increase or decrease the volume respectively.

Allowable Subject Matter

9. Claims 47 and 48 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

10. The following is a statement of reasons for the indication of allowable subject matter:

The primary reason for the allowance of claim 47 is the inclusion of the limitations being for a liquid ejection apparatus wherein the pattern data adjuster controls the ejection pattern data for tone correction of a liquid droplet that has a tone that deviates from a pre-determined tone by a pre-determined amount. It is this limitation found in claim, as they are claimed in the combination, that has not been found, taught or suggested by the prior art of record which makes these claims allowable over the prior art.

The primary reason for the allowance of claim 48 is the inclusion of the limitations being for a liquid ejection apparatus wherein the pattern data adjuster controls the ejection pattern data for tone correction of a tone that deviates from a predetermined tone. It is this limitation found in the claim, as they are claimed in the combination, that has not been found, taught or suggested by the prior art of record which makes these claims allowable over the prior art.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Hosono et al. (US 2003/0234826) includes adjusting the number of times ink droplets are ejected, thereby controlling the ink amount droplet impacted per unit area, on the basis of color adjustment.

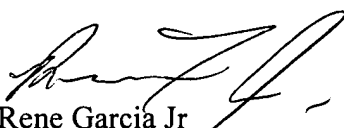
Art Unit: 2853

Communications with the USPTO

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rene Garcia, Jr. whose telephone number is (571) 272-5980. The examiner can normally be reached on M-F 8:00AM - 4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen D. Meier can be reached on (571) 272-2149. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Rene Garcia Jr
21 February 2006

 2/00
K. FEGGINS
PRIMARY EXAMINER